Abstract View

COCAINE SELF-ADMINISTRATION OPERANT BEHAVIOR FOLLOWING CHRONIC ORAL METHYLPHENIDATE EXPOSURE:A RAT MODEL

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The psychostimulant methylphenidate (MP) is the most prescribed drug used in treating Attention Deficit Hyperactivity Disorder (ADHD). With an estimated 3 million American children currently taking MP, it has become a controversial drug. The debate over MP is growing over concerns relating to its medicinal value and long-term effects. The question of whether chronic exposure to MP influences an individual's risk for drug abuse later in life remains unclear.
The present study utilized a rodent chronic oral MP paradigm. Young (4 week old) male Sprague Dawley rats were divided into three treatment groups: a) 2 mg/kg MP, b) 1mg/kg MP, and c) Vehicle (water). Rats were individually housed and had 24h free access to food and a drinking bottle containing one of the above. Body weight and locomotor activity in an open field chamber were monitored for all rats for 30 weeks. After 28 weeks, oral methylphenidate was replaced with water. At this point, all animals were microsurgically implanted with a jugular vein catheter and placed in operant test chambers for daily 1h sessions. In each session, rats had the opportunity to lever press an active lever that would result in an intravenous infusion of cocaine (1 mg/kg). Rats were maintained on this cocaine self administration protocol for up to 60 days. Significant differences were observed in the number of cocaine infusions, lever presses and in the pattern of administration between the 3 groups. In addition, this study examined the dopamine D2 receptor profile in these same rats before MP exposure and after 28 weeks of MP exposure using C11-raclopride and micro positron emission tomography ($_{\mu}$PET).
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